What is claimed is:

1. A polishing composition used in a final polishing step of a manufacturing process of a semiconductor device, wherein the semiconductor device includes an insulation layer having a surface on which trenches are formed, and a conductive layer formed on the insulation layer, the polishing composition comprising:

colloidal silica compounded in said polishing composition in a quantity larger than 50 g/liter and smaller than 160 g/liter;

a periodic acid compound;

ammonia;

ammonium nitrate; and

water, wherein the polishing composition has a pH that is in the range of 1.8 to 4.0.

2. The composition according to claim 1, wherein the periodic acid compound is at least one compound selected from the group consisting of orthoperiodic acid, metaperiodic acid, dimesoperiodic acid, mesoperiodic acid, diorthoperiodic acid, ammonium periodate, potassium periodate and sodium periodate.

3. The composition according to claim 1, wherein the periodic acid compound compounded in said polishing composition is in a quantity larger than 6 g/liter and smaller than 12 g/liter.

4. The composition according to claim 1, wherein the ammonium nitrate compounded in said polishing composition is in a quantity larger than 5 g/liter and smaller than 15 g/liter.

5. The composition according to claim 1, wherein the polishing composition contains aluminum, gallium, indium, thallium, tin, lead, bismuth, and each of the elements that belongs to the groups II to XII in the periodic table not more than 100 ppb.

6. The composition according to claim 1, wherein a ratio of polishing rate of the composition for the conductive layer to that for the insulation layer is 1 : 0.6 to 1 : 1.3.

7. The composition according to claim 1, wherein the average particle diameter of the colloidal silica, which is calculated based on the specific surface area measured in accordance with a specific surface area measuring method utilizing gas adsorption of powder, is 60 to 100 nm.

8. The composition according to claim 1, wherein the average particle diameter of the colloidal silica calculated in accordance with light scattering is 150 to 250 nm.

9. A method of preparing a polishing composition used in a final polishing step of a manufacturing process of a semiconductor device, wherein the semiconductor device includes an insulation layer having a surface on which trenches are formed, and a conductive layer formed on the insulation layer, the method comprising the steps of:

mixing colloidal silica, a periodic acid compound, ammonium nitrate, and water; and

adding ammonia to the mixture to adjust the pH of the mixture to 1.8 to 4.0.

10. The method according to claim 9, wherein the periodic acid compound is at least one compound selected from the group consisting of orthoperiodic acid, metaperiodic acid,

dimesoperiodic acid, mesoperiodic acid, diorthoperiodic acid, ammonium periodate, potassium periodate, and sodium periodate.

11. The method according to claim 9, wherein the periodic acid compound compounded in said polishing composition is in a quantity larger than 6 g/liter and smaller than 12 g/liter.

12. The method according to claim 9, wherein the ammonium nitrate compounded in said polishing composition is in a quantity larger than 5 g/liter and smaller than 15 g/liter.

13. The method according to claim 9, wherein the average particle diameter of the colloidal silica, which is calculated based on the specific surface area obtained by measurement in accordance with a specific surface area measuring method utilizing gas adsorption of powder, is 60 to 100 nm.

14. The method according to claim 9, wherein the average particle diameter of the colloidal silica calculated in accordance with light scattering is 150 to 250 nm.

15. A method for polishing a semiconductor device that includes an insulation layer having a surface on which trenches are formed, and a conductive layer formed on the insulation layer, the method comprising:

a first polishing step in which the conductive layer is polished until the thickness of the conductive layer becomes 200 nm or less; and

a second polishing step in which the conductive layer and the insulation layer are polished so that the surface of the insulation layer is exposed, wherein the second polishing step includes using a polishing composition that contains:

colloidal silica compounded in said polishing composition in a quantity larger than 50 g/liter and smaller than 160 g/liter;

a periodic acid compound;

ammonia;

ammonium nitrate; and

water, wherein the polishing composition has a pH that is in the range of 1.8 to 4.0.